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Review

## Management of heart failure in The Netherlands

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### Abstract

In The Netherlands, the incidence and prevalence of heart failure are rising as is the case in most other European countries. Overall, there are 200,000 patients with heart failure in The Netherlands and around 25,000 hospitalisations annually with a discharge diagnosis of heart failure. Most of these patients are managed in primary care, often together with a cardiologist.

There is an active guideline program in different professional organisations (e.g. general practitioners, cardiologists) and in 2002 a collaborative multidisciplinary guideline for management of chronic heart failure was developed. However, there is clearly room for improvement in the adherence to these guidelines both with regard to the diagnosis and the treatment of HF patients. For example, ACE-I and  $\beta$ -blockers are still under-prescribed. In particular, the more severely ill patients seem to be under treated. At present, general practitioners and cardiologists differ in their views on heart failure, resulting in differences in diagnosis and management. In addition to the multidisciplinary guidelines, several other initiatives have been developed to improve outcomes in these patients, such as rapid access clinics and outpatient heart failure clinics.

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**Keywords:** Heart failure; The Netherlands; diagnosis; treatment; disease management

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### 1. Introduction

Although the borders between different European countries are becoming less strict, there are still notable differences in health care delivery between countries. In

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recent years, there have been several reports in the *European Journal of Heart Failure* on management of heart failure in different European countries, including Poland, France, and Sweden [1–3]. The Netherlands has made a substantial contribution to many HF trials, managed by the Dutch working group in cardiology centers and it seems that the health care providers in The Netherlands are quick to adapt to new developments [4]. In this paper, the current status and developments in the management of heart failure in The Netherlands are discussed.

## 2. Epidemiology of heart failure in The Netherlands

Cardiovascular diseases are still the main cause of premature death in The Netherlands. In 2002 total mortality was 142,355, of which 34% was due to cardiovascular diseases. Compared to the European average, mortality from circulatory diseases in The Netherlands is slightly below average. Other major causes of death are cancer (28%) and respiratory disease (10%) [5].

In line with most countries in Europe, prevalence and incidence of HF are high and the number of patients with chronic HF is growing. Recently, results of the Rotterdam study (based on 7983 persons over 55 years of age) suggested, that in individuals aged 55, almost 1 in 3 will develop heart failure during their remaining life span [6]. The same study determined point prevalences of 6.4%, 6.7% and 7.0% in 1997, 1998, and 1999, respectively. The mean age of the study population increased from 73.3 years in 1997 to 74.5 years in 1999. The prognosis of participants with heart failure was poor, with a 5 year survival of 35% [6].

Costs related to cardiovascular diseases amounted to 10.1% of the total costs of the Dutch Health Care System in 1999, of which 28% was related to stroke, 26% to ischemic heart disease, and 8% to heart failure [5].

In 1999, 24,868 hospitalisations were registered with a discharge diagnosis of heart failure [7], which equates to about 16.1 admissions per 10,000 inhabitants. Readmission rates for HF in The Netherlands are lower compared to other European countries. However, at the same time the duration of stay is longer than in other European countries [8]. In The Netherlands, readmission rates are used as the official indicator of quality of HF care by the Dutch Health Inspectorate.

Heart failure severely affects the quality of life of patients. From international data it is known that compared to the general population and compared to patients with other chronic diseases, heart failure patients have a significantly decreased quality of life [9]. Several studies in the Dutch population have found that different domains in the area of quality of life are affected by heart failure [10–12].

## 3. Organisation of health care services in The Netherlands

The Dutch health care system is a gate-keeping system, where patients can only consult a specialist/cardiologist after referral from a general practitioner (GP). GPs are self-employed and each patient is registered with one GP. Cardiologists are usually also self-employed but hospital-based and work in partnerships, with the exception of academic hospitals which employ specialists with multiple tasks such as patient care, teaching, and research.

At present, health insurance in The Netherlands is a mixed public–private system. The majority of people (61%) are covered by the public system, while 37% have private insurance, and 2% of the population have no insurance. In principle, all health care costs for chronic heart failure are covered, although private insurance packages often include deductibles. In the near future, more co-payment strategies will be implemented, while a proposal for a major system change is at present being discussed by politicians. Reimbursement of costs for chronic heart failure care is unlikely to be affected, because accessibility when needed will remain the key issue.

## 4. Management of patients with heart failure

Since the end of the eighties The Netherlands have had the active guideline program of the Dutch College of General Practitioners (NHG) and the Dutch Institute for Health Care (CBO). The first NHG-guideline on diagnosis and treatment of heart failure in General Practice was published in 1995, this was followed in 2002 by a collaborative guideline produced by GPs and cardiologists, which covered diagnosis, treatment, and care [13]. This new guideline is mostly in line with the ESC guideline [14], the major difference being that The Netherlands sees a greater role for diuretics. While in the ESC guideline diuretics are recommended only in combination with ACE-inhibitors, in The Netherlands, by contrast, diuretics explicitly should not be stopped and ACE-inhibitors are recommended in addition. In the earlier version of the NHG guideline, diuretics were recommended always as the first drug, also for diagnostic reasons.

### 4.1. Diagnosis of heart failure

In primary care, a history of myocardial infarction or hypertension, symptoms of dyspnoea, peripheral oedema, the presence of pulmonary crepitations, and elevated jugular venous pressure are qualified as important clinical signs and symptoms in diagnosing heart failure. Chest radiography and electrocardiography are used most often to support diagnosis. In general, GPs tend to diagnose heart failure on clinical grounds, supported by a diagnostic trial of diuretics [15]. In the European IMPROVEMENT-HF study in primary care, only 10% of Dutch primary care

physicians would routinely ask for an Echocardiogram, while in effect 84% of those patients had Echo results available [16]. This may be a consequence of the older GP guideline (1995) which states that echocardiography is of limited value for the diagnosis of heart failure (though the newer guideline does indicate the need for echocardiography), as well as poor GP access to echocardiography. Cardiologists all rely on echocardiography along with other diagnostic tests. A few hospitals offer a heart failure diagnosis and treatment advice service to GP's in a 'rapid-access-clinic'. More recently BNP/NTproBNP tests have been introduced as diagnostic aids in several hospitals in The Netherlands.

#### 4.2. Treatment of heart failure

The international indicator of quality of HF treatment is the percentage of HF patients who receive ACE inhibitors (ACE-I) or  $\beta$ -blockers. In The Netherlands prescribing of ACE-I in primary care in 2000 varied from 18.3% in a national study [17] to almost 60% in the Improvement-HF study in 1999/2000 [19]. Prescribing at hospital discharge was found to be about 70% [18]. ACE-I use has remained stable between 1996 and 2000 with a slight increase from 38.6 to 42.6% [20]. Prescribing of angiotensin-II antagonists and spironolactone increased over the same period, although the use of these drugs was still comparatively low in 2002 (9.0% and 11.4% of HF patients, respectively).  $\beta$ -Blocker use is still low with 26% of primary care patients and 37% of hospitalized patients receiving this treatment [18,21].

Optimal heart failure treatment differs depending on the severity of the disease and usually involves a combination of drugs (Table 1) [19]. As is to be expected, combination therapy increases as disease severity increases. However,

this study also found evidence that more severely ill patients (NYHA III and IV) had a higher risk of being undertreated, than less severely ill patients [19].

#### 4.3. Differences between GPs and specialists in management of HF patients

There are clear differences between General Practitioners and cardiologists in their views, and practices on HF. The basis for these differences is the type of guideline used. While specialists primarily rely on the international literature and policies in their own hospital departments, general practitioners rely on the Dutch national GP guidelines, and regional guidelines [22]. GPs and cardiologists also differ in their diagnosis and management of HF. While GPs tend to diagnose more on clinical grounds, cardiologists use more diagnostic investigations [15].

GPs and cardiologists also treat different patient populations. In general, GPs treat more women and more elderly patients, whereas cardiologists treat more men, their patients are on average younger, and with more ischemic heart disease as a co-morbidity. Patients treated by cardiologists are more likely to receive ACE-I,  $\beta$ -blockers, spironolactone, and angiotensin-II antagonists, while most GP patients receive a diuretic [21]. One might therefore expect, that GP patients who have been referred to a cardiologist are more likely to receive an ACE-I; however, a recent study found that this was not true and neither was there an effect of prior hospitalisation [22]. The only positive predictor was the involvement of a specialised HF clinic, which resulted in more ACE-I use. The use of ACE-I in GP cannot be predicted by patient and clinical characteristics, with the exception of age (the older the less ACE-I), and gender (men get ACE-I more often).

Table 1

Combination regimes: percentage of patients by NYHA class treated with the major treatment regimes (diuretics, ACEI,  $\beta$ -blockers, digoxin, or spironolactone)

	NYHA 1	NYHA 2	NYHA 3	NYHA 4	All heart failure patients
None	22.4 (15.3 to 29.4)	8.3 (4.9 to 11.7)	0.9 (0.2 to 3.1)	0.7 (0.1 to 3.7)	7.0 (5.2 to 8.8)
Diuretic monotherapy	3.7 (0.5 to 6.9)	8.7 (5.2 to 12.2)	9.9 (6.1 to 13.8)	10.7 (5.7 to 15.6)	8.6 (6.4 to 10.2)
ACEI monotherapy	8.2 (3.6 to 12.9)	8.7 (5.2 to 12.2)	3.0 (0.8 to 5.2)	0.7 (0.1 to 3.7)	5.3 (3.7 to 6.9)
$\beta$ -blocker monotherapy	23.1 (16.0 to 30.3)	11.5 (7.5 to 15.4)	4.7 (2.0 to 7.5)	2.0 (0.7 to 5.7)	9.6 (7.5 to 11.7)
Diuretic and ACEI	3.7 (0.5 to 6.9)	13.4 (9.2 to 17.6)	21.1 (15.9 to 26.4)	18.7 (12.4 to 24.9)	15.1 (12.6 to 17.6)
Diuretic and $\beta$ -blocker	6.0 (2.0 to 10.0)	5.9 (3.0 to 8.8)	4.7 (2.0 to 7.5)	2.0 (0.7 to 5.7)	4.8 (3.3 to 6.3)
Diuretic and digoxin	0.7 (0.1 to 4.1)	3.2 (1.0 to 5.3)	4.7 (2.0 to 7.5)	5.3 (1.7 to 8.9)	3.6 (2.3 to 5.0)
ACEI and $\beta$ -blocker	15.7 (9.5 to 21.8)	9.1 (5.5 to 12.6)	3.9 (1.4 to 6.4)	0.7 (0.1 to 3.7)	7.0 (5.2 to 8.8)
Diuretic and ACEI and $\beta$ -blocker	3.0 (1.2 to 7.4)	9.5 (5.9 to 13.1)	8.2 (4.7 to 11.7)	7.3 (3.2 to 11.5)	7.5 (5.7 to 9.4)
Diuretic and ACEI and digoxin	6.0 (2.0 to 10.0)	7.5 (4.3 to 10.8)	11.2 (7.1 to 15.3)	14.7 (9.0 to 20.3)	9.8 (7.7 to 11.8)
Diuretic and ACEI and spironolactone	1.5 (0.4 to 5.3)	2.0 (0.3 to 3)	3.9 (1.4 to 6.4)	10.7 (5.7 to 15.6)	4.2 (2.7 to 7.6)
Diuretic and ACE and $\beta$ -blocker and digoxin	1.5 (0.4 to 5.3)	1.6 (0.6 to 4.0)	6.0 (3.0 to 9.1)	3.3 (0.5 to 6.2)	3.3 (2.0 to 4.5)
Diuretic and ACEI and digoxin and spironolactone	0	1.2 (0.4 to 3.4)	3.4 (1.1 to 5.8)	6.7 (2.7 to 10.7)	2.7 (1.6 to 3.9)
Other <sup>a</sup>	4.5 (1.0 to 8.0)	9.4 (5.9 to 13.1)	14.4 (9.7 to 18.7)	16.5 (10.7 to 22.6)	11.5 (9.2 to 13.7)
Total	100 (n=134)	100 (n=252)	100 (n=232)	100 (n=150)	100 (n=769)

95% confidence intervals are presented in parentheses (adapted from Ref. [19]).

<sup>a</sup> Other cardiovascular agents in addition to those included in this table may have been used. Other combinations not shown in the table were used by less than 5% of heart failure patients in each NYHA class.

## 5. Organisation of heart failure care

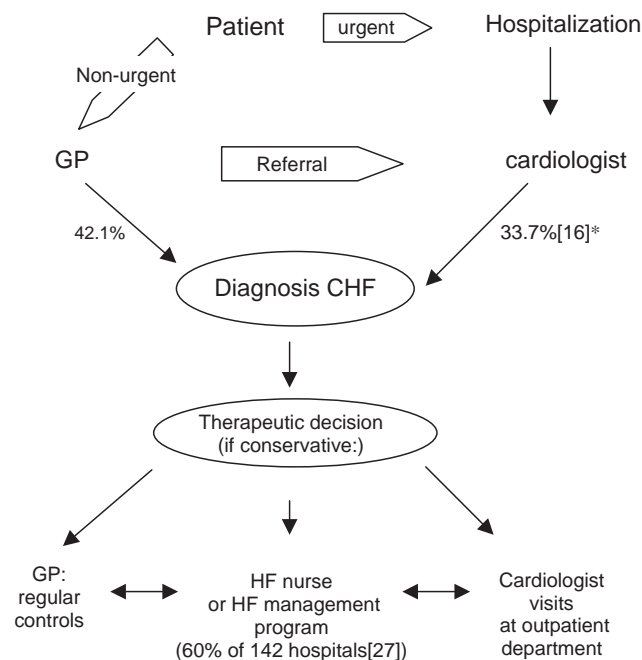
Patients with HF and/or left ventricular dysfunction form a heterogeneous group. Patients with HF diagnosed and who are being treated within the health care system, merely represent the tip of the iceberg [24]. Data from the European IMPROVEMENT-HF study indicate that the initial diagnosis of HF was made by the patient's GP for 42.1% of the patients, by hospital cardiologist for 33.7%, and for 9.4% by another GP [16] (Fig. 1).

As care provided to HF patients is related to the underlying cause and individual circumstances, organisation of care may differ. For example, HF caused by a congenital heart disease may require highly specialised cardiac care, while in contrast, elderly patients with HF due to systolic dysfunction are mostly treated and cared for by their GP's. Professionals who may be involved in treatment and care of HF patients are: GP, cardiologist, heart failure nurse, home care, internist, dietician, pharmacist, social worker, psychologist, physical therapist, geriatrician, and nurse practitioner in GP.

The involvement of the GP is variable and depends on the stage of the disease. Currently, the GP is mostly involved at the beginning and the end (terminal) stage of the disease [24]. The majority of HF patients are managed in primary care, though often together with a cardiologist. Usually the cardiologist sees a stable HF patient once or twice a year, while the GP provides daily care throughout the year. In a recent study in the North of The Netherlands, 33% of HF patients in General Practice had seen a cardiologist in the previous year [23]. Cardiologist involvement in treatment is not always

detectable from treatment data; in many cases the cardiologist will initiate new treatment that is then continued by the GP [25]. No exact data can be given, because such practices vary depending on the cardiologists and GPs involved.

Several initiatives have been developed to improve health outcomes in patients, of which HF management programs are the most important. The first heart failure clinic started in 1994 and similar initiatives started soon after. Although there is still a lack of evidence in The Netherlands for the beneficial effects of HF management programs, numbers are increasing steadily (42% of all hospitals had a HF management program in 2000, this had increased to 60% in 2003) [26,27]. Most programs are organized as outpatient clinics. Cardiologists and nurses are involved in all HF programs, other professionals involved include: physical therapists (47%), general practitioners (29%), and dieticians (59%). All the programs offer follow-up after discharge from hospital and in 95% of the programs patients have increased access to a health care provider. Other important components of HF programs are (restricted) physical examination (90%) and optimization of medical treatment (65%) by the HF nurse, exercise programs (43%), behavioural interventions (68%), psychosocial counselling (64%), patient education (88%), and support for informal caregivers (59%) [27]. There is no uniformity of funding for programs. Seventy percent of institutions finance their programs at least partly themselves, but are often supported by the pharmaceutical industry (27%) and health insurance companies (35%). Two randomised trials (DEAL and COACH) are currently



\* Remaining 24.8% diagnosed by: other GPs (9.4%), hospital GPs (1.6%), geriatricians (0.3%), other (3%), and missing (9.9%)

Fig. 1. Flowchart of patient pathway through the system.



ongoing to evaluate the effects of HF clinics in The Netherlands [28].

Other programs that provide specialised care for HF patients by a pharmacist [29] or home care [30] are still scarce and require further development. There is great diversity in the content, intensity, professionals involved, and financing of these programs. In addition, there is a lack of formal agreements about responsibilities, competencies and jurisdiction. There is currently lively debate about the autonomy of the HF nurse regarding lifestyle counselling and prescription of medication (which is not legally allowed) and the optimal 'chain of care' for patients with heart failure.

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